

MEMORANDUM

17 December 2019

To: Maisa Fumagalli
Provincial Officer
Sarnia District Office

From: Jeff Markle
Scientist
Technical Support Section

Re: 2018 Annual Landfill Report
Appendix G
Clean Harbors Canada Ltd.
ECA No. A031806
prepared by GHD
dated: 2 March 2018
and
Letter report entitled GHD Response to MECP Comments
Prepared by GHD
dated 27 November 2019

I have reviewed Appendix G of the 2018 Annual Report for the Clean Harbors landfill site (the Site). Appendix G presents the results from the groundwater monitoring completed at the Site in 2018. As well, I reviewed a letter report prepared by GHD dated 27 November 2019. This letter report provided responses to my comments on the 2017 Annual Report found in my memorandum dated 11 February 2019 to Mr. Don Hayes.

My comments on the 2018 Annual Report are as follows:

1. Section 6.1: GHD makes several recommendations. I agree with each of these recommendations, except for the fourth recommendation in which GHD recommends that the groundwater monitoring program be rationalized. While I can agree to consider a proposal to rationalize the groundwater monitoring program, I can not agree the program should be rationalized unless suitable justification can be provided.

2. GHD recommends that the leachate be sampled twice a year to characterize the quality. I agree with this recommendation.
3. Page 12, GHD recommends that TW45-99D be redeveloped. I agree with this recommendation.
4. In 2017, acetone and methyl ethyl ketone were detected at TW48-00D and TW49-00D. In 2019, these parameters were not detected at these monitoring locations and GHD concludes that 2017 results were anomalous. I agree with this conclusion.

I provided 27 comments to Mr. Don Hayes on the 2017 Annual Report in my memorandum dated 11 February 2019. GHD addressed many of these comments in the 2018 Report, and also explicitly responded to these comments in their letter dated 27 November 2019. The GHD letter report provided a very thorough response to my comments on the 2017 Annual report. My review of GHD's responses is provided below in the order of my original comments.

1. No further comment.
2. No further comment.
3. Thank you for the clarification. I agree with GHD's recommendation to assess the condition of TW32-94-II and add it to the groundwater level monitoring program if it is in acceptable condition.
4. GHD speculates that the difference in the height of the northern and southern berms and the changes in the drainage pattern along the perimeter of the site may be contributing to the decline in groundwater levels at TW39-99S, TW46-99S and TW61-13S. At this point there is insufficient data to confirm this. Subsequent monitoring results may help confirm if these are contributing factors or not.
5. No further comment.
6. No further comment.
7. GHD proposes to assess the condition of TW42-99S and provide recommendations based on their inspection results. This is a reasonable proposal. No further comment.
8. No further comment.
9. No further comment.

10. GHD proposes to monitor the new surface water pond elevation and compare the pond level to the LCS level to assess the horizontal gradients in this area. This is a reasonable approach. No further comment.
11. No further comment.
12. GHD outlines several measures that will be taken to improve their ability to control leachate production and maintain the leachate levels. It is important that these measures be effective. Monitoring through 2020 will assist with evaluating their efficacy. If leachate levels can not be controlled, then additional measures may be necessary.
13. No further comment.
14. No further comment.
15. No further comment.
16. No further comment.
17. No further comment.
18. No further comment.
19. No further comment.
20. Thank-you for the very comprehensive response. The analysis completed by GHD shows that Shewhart Control Charts are an appropriate method of evaluating the water quality data at the Clean Harbors landfill. No further comment.
21. GHD investigated the influence of non-detects method substitution on trend analyses. They found that overall the method of substitution did not have a large influence the regression results. I agree with their analysis and findings.

Based on their findings, GHD suggested that non-detect values should be handled using the Kaplan-Meyer method. They also recommended that the trend tests should be completed using the Mann-Kendall trend test and the Theil-Sen slope procedure. I agree with all these recommendations.

No further comments.

22. No further comments.

23. No further comments.

24.

- a. Addressed in response to comment 21. No further comment.
- b. Thank you for the explanation. No further comment.
- c. No further comment.
- d. No further comment.

25. Thank-you. No further comment.

26. No further comment.

27. No further comment.

Limitations:

The purpose of the preceding review is to provide advice to the Ministry of the Environment and Climate Change regarding subsurface conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on information provided by others, except where otherwise specifically noted. The Ministry cannot guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as endorsing the content or views expressed in the reviewed material.

If you have any questions, please contact me.



Jeff Markle
Scientist
Southwestern Region